



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

DESCRIPTION OF A NEW HYDROBIINOID GASTEROPOD FROM THE MOUNTAIN LAKES OF THE SIERRA NEVADA, WITH REMARKS ON ALLIED SPECIES AND THE PHYSIOGRAPHICAL FEATURES OF SAID REGION.

BY ROBERT E. C. STEARNS.

The interesting form herein described was first brought to my notice through the kindness of Mr. Xenos Clark, son of the lamented Prof. Henry James Clark, in 1879. Owing to ill-health and other causes, it has remained undescribed until this time. Recently I have been stimulated to inquire into its characters and relationship, by the reception of a letter and further specimens from Prof. R. Ellsworth Call, who, while believing it to be undescribed, thought possibly it had been made known by some of our West Coast naturalists, and wrote to me for information.

While it appears to have certain analogies with *Lioplax* of the Viviparidæ on the one side (see *L. subcarinata* Say), and with the Strepomatidæ (see the carinated Goniobasæ like *G. torulosa* ¹ Anthony), on the other, yet the sum of its characters, inclusive of faunal and geographical relationship, seems to me to point rather in the direction of the fresh-water Rissoids. The late Dr. Stimpson's genus *Tryonia* applies only to shells with a "surface longitudinally ribbed or plicated," as distinct from the usual smooth-surfaced shells of the various groups embraced in his "Researches, etc." ² He includes, however, the little group *Pyrgula* of Cristoforo and Jan, and arranges it directly preceding *Tryonia*, which my judgment confirms as being its proper place.

Woodward ³ included this genus (*Pyrgula*) in his synonymy of *Melania*; he also placed *Amnicola* as a subgenus of the foregoing. H. and A. Adams ⁴ place *Pyrgula* with the Melanians, but *Amnicola* is grouped by them with the Rissoidæ. They further include

¹ L. and F. W. Shells of N. A. Part IV, p. 229, S. T. Miss. Coll., 253. See also Meek and Hayden's Tertiary *Goniobasis tenuicarinata*, Proc. Phila. Acad. Nat. Sci., 1857, p. 124, and *G. nebrascensis*, id., 1856, p. 124. Also Wheeler's Report. Palæontology, vol. iv, and Hayden's Inv. Palæontology, vol. ix.

² Researches upon the Hydrobiinæ and allied forms. Smiths'n Misc. Coll., 201.

³ Recent and Fossil Shells, 2d ed., pp. 246, 247.

⁴ Adams' Genera, pp. 306-308, vol. i.

the genus *Tricula* of Benson with the Melaniidæ, an arrangement which has been followed by Chenu.¹

Benson's *Tricula* is based upon a small fluviatile form which the Adams say "somewhat resembles *Paludomus*; * * * * the only species known is an inhabitant of the River Kamaan in India." The specific name *montana* implies a station similar to those inhabited by the various species of *Pyrgula* herein quoted. The figure of *Tricula* as given by the Adams and Chenu, together with the totality of testimony furnished by said authors, leads me to suspect that the Indian species should be removed from the Melaniidæ to the Hydrobiinæ and near to *Pyrgula*.

It is not without some little hesitation that I place the Sierra Nevada shell in the genus *Pyrgula*. Its principal characteristics, however, indicate said group as well as the environmental features. Stimpson's generic description of *Tryonia* applies only to shells longitudinally sculptured ("ribbed or plicated"), a too restricted limitation for a generic standard in this case, because if literally applied it would exclude ninety-five per cent. of the individuals which form the mass of which Stimpson's² species is but a rare varietal aspect. Upon this point he wrote: "In company with the Tryoniæ, Mr. Blake found a small cancellated shell, which has been described as *Melania exigua* by Conrad, and as *Amnicola protea* by Gould. In view of the character of the surface, I think it scarcely possible that this species can belong to the Hydrobiinæ. It will, perhaps, be found to be allied to *Bittium*. The occurrence of this marine or brackish-water genus in the Desert would not be surprising, since *Gnathodon* was found in the same basin at a point somewhat nearer the Gulf." It is quite evident to my mind that Stimpson could not have had a very large number of specimens as they are usually found; if so, they would have included not only his *T. clathrata*, as well as Conrad's and Gould's types, but intermediate and connecting varieties, sufficient to have caused him to expand his generic diagnosis, and either to have made him hesitate before investing the variety before him with specific dignity, or else to have included Conrad's and Gould's forms as species of *Tryonia*. He was not aware of the countless millions of these tiny shells, that are scattered over a vast area, or of the depth of the fresh-water sedimentary deposit throughout which

¹ Manuel de Conchyliologie, etc., p. 294, vol. i.

² Researches, etc., etc., *id.*, p. 48, *et seq.*

they are distributed. At Walter's Station, on the Southern Pacific Railroad, the perpendicular section exhibited by the digging of a well to the depth of forty-seven feet, contained these shells from the surface of the desert to the bottom of the well.¹ Again, in suggesting relations between Conrad's and Gould's forms with *Bittium*, a genus belonging to the brackish-water division or sub-family (Potamidinæ) of the Cerithiidae, he seems to have overlooked the fact that the longitudinally plicated sculpture of his species is a character common also to the brackish-water genus *Cerithidea*, which belongs as well as *Bittium* to the Potamidinæ.²

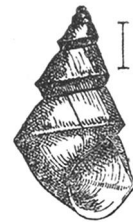
Had Stimpson's generic definition of *Tryonia* been more ample I should have been tempted to have given the shell herein discussed a place in said group rather than *Pyrgula*, which latter, as figured by the Adams and Chenu, shows an angular termination to the aperture at the base of the columella, indicative of a more pronounced feature in the soft parts (siphonal) at this point than the rounded aperture of *Tryonia* and *Tricula* (as figured), and the form before me presents. This, however, is a somewhat variable feature as between individuals of the same species, and still more so between forms of one species as compared with forms of another.

With the concurrence of Prof. Call, I have described the shells received from him and Mr. Clark as follows:

Genus **PYRGULA** Cristoforo and Jan.

Pyrgula Nevadensis, n. s.

Shell small, elongated, ovate-conic, turreted; number of whorls five to six (5-6), with a conspicuous keel following spirally the periphery of each and terminating near the middle of the outer edge of the continuous peristome, which is otherwise simple, ovate and slightly effuse, and appressed (to the whorl) above; in some specimens somewhat produced on its inner side and suggesting a faint umbilicus. Shell white or nearly so; smooth and glossy, with a slight epidermis on



¹ For further information on this point, see my remarks on the "Fossil Shells from the Colorado Desert," in *Am. Naturalist*, March, 1879.

² The connection of the marine Cerithiidae with the fresh-water Melaniidae through the brackish-water Potamidinæ, seems natural and logical. In this connection the remarks of Swainson in his "Treatise on Malacology," are well worth perusing.

some specimens. Dimensions as follows, being the measurement of ten (10) specimens, all adult :

Longitude	·14,	Latitude	·08 inch.
"	·15,	"	·08 "
"	·16,	"	·09 "
"	·17,	"	·09 "
"	·17,	"	·09 "
"	·18,	"	·10 "
"	·18,	"	·10 "
"	·22,	"	·10 "
"	·22,	"	·11 "
"	·21,	"	·12 "

The mean of the above measurements is eighteen-hundredths of an inch in length by ninety-six-thousandths of an inch in breadth, or very nearly two to one. The largest specimen measured ·23 by ·13 inch. Aperture about one-third the length of the shell, being as forty-one to one hundred and twenty ($\frac{41}{120}$). Of the sixteen specimens examined ¹ nine are from Pyramid Lake (Clark), and seven from Walker's Lake (Call).

The Pyramid Lake lot, from Mr. Clark, were accompanied by specimens of the flat-spined form of *Pompholyx effusa*, to which Dr. Dall has given the name of "*var. solida*."²

The several specimens of *Pyrgula Nevadensis* exhibit similar differentiation as *Tryonia* in size of mouth, variability in coil, robustness or attenuation; and many of the specimens from the alkaline deposit of the lake bottom are discolored, varying from light ashen slate to dark slate, approaching black.

In connection with the above, I have to thank Professor Call for the following notes :

"I have it as collected by the U. S. Geological Survey the past

¹ Subsequently thirty-two specimens, adolescent and mature, from the dredging "(1)" Pyramid Lake; and about the same number, young and adult, from "(2)" North Shore, Pyramid Lake, were received from Prof. Call and examined with care.

² Annals of Lyceum of Nat. History of N. Y., March, 1870, p. 334. The locality here given, through some misapprehension, is "Clear Lake," which is in California; it should read "White Pine, Eastern Nevada." Dall, in *Science*, vol. i, No. 7, page 202 (March 23, 1883), refers to the occurrence of *Pompholyx effusa* in a calcareous deposit in Pyramid Lake, and remarks on its variations.

summer. Where known, I give the name of the collector as authority for locality. (1) From dredgings of Pyramid Lake bottom; *Russell* (I. C.); August 30, 1882. (2) North side of Pyramid Lake, Nevada; *Russell* (I. C.). (3) In tufa, shore of Walker's Lake, Nevada; *Russell* (I. C.), and also loose. This is the locality represented by the shells sent to you.

"Pyramid Lake,¹ although it receives the fresh water of the Truckee River, the outlet of that gem of lakes, Tahoe, is very strongly alkaline, and the water is not good for human use, although it can be used for a short period without much inconvenience."

The elevation of Pyramid Lake is 4890 feet, as stated in Gannett's² List, etc., and Walker's Lake, according to the same authority, has an altitude of 3840 feet. The water of this lake is probably similar to that of Pyramid; it is brackish, as I have been informed by Prof. Joseph LeConte.

These lakes are the remnants of the great tertiary lake which covered this general region, and are the pockets or deeper depressions in the floor of the ancient lake; the bitterness of their waters being the result of the accumulated alkaline and saline sediments, or dregs, of centuries.

Assuming that I have placed the above form in its proper position, much greater interest attaches to it than that of the addition of a new species to the fauna of the general region within which it is found, or that of adding a peculiar type to the living molluscan fauna of the North American continent.

The species of *Pyrgula* heretofore described,³ are the type, *P. helvetica*, from Switzerland; *P. bicarinata*, France; *P. pyrenaica*, from the Pyrenees; and *P. andicola*, from the Andes of Bolivia.

Its distribution hitherto, it will be seen, is Europe and South America; inhabiting, as Stimpson observed, "fresh waters in mountainous regions," and as he further remarked, "It is interesting to notice that all the species of the genus as yet described are severally reported to occur in mountainous districts; an instance of correlation of form to external conditions."

¹ Lieut. Symons, in Lieut. Wheeler's Report Geog. Survey, etc., 1878, p. 114.

² U. S. Geol. Survey. Hayden, Misc. Pub., No. 1. Fourth Ed.

³ *Vide* Stimpson, *ibid.*

These facts tend to give this new species¹ its chief importance, and point to further interesting discoveries.

Specimens of *Pyrgula Nevadensis* have been distributed to the Museum of the Acad. Nat. Sci. Phila.; the U. S. National Museum, Washington; the Museums of the University of California and California Acad. of Sciences; and are contained in the cabinets of Professor A. E. Call and my own.

¹ Mr. John Wolf has described *Pyrgula scalariformis* from the post-pliocene of Tazewell, Illinois River. *Vide* Tryon, in Proc. Acad. Nat. Sci. Phila., May 1, 1873.